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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
CASTRO, ANGEL A	

ART UNIT	PAPER NUMBER
2653	

DATE MAILED: 03/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/815,069	HONJO ET AL.	
	Examiner	Art Unit	
	Angel A Castro	2653	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 October 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-72 and 99-103* is/are pending in the application.

4a) Of the above claim(s) *1-36,63-67 and 99-103* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *37-62 and 68-72* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/672,597.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/31/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I, Species 2 in a Paper filed 10/29/04 is acknowledged.

2. Claims 1-36, 63-67, 99-103 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Group and Species. Election was made **without** traverse in a Paper filed 10/29/04.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 49-50 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Is not clear from the claim what kind of mixture the claim is referring to (a mixture of elements or layers or alloys).

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 37, 46-58, 62, 68, 70, 72 are rejected under 35 U.S.C. 102(e) as being anticipated by Vas'ko et al (U.S. Pat. 6,562,487).

Regarding claim 37, Vas'ko et al discloses a magnetic head (figure 5) comprising:

a substrate having a principal surface;

a first magnetic layer 316 formed on the substrate;

a recording gap layer 318 formed on the first magnetic layer;

an insulating layer 324 formed on the recording gap layer except for a pole tip region;

a write coil 326 enclosed with and insulated by the insulating layer;

an antistripping layer 502, 402 formed on the insulating layer and on the pole tip region of the recording gap layer; and

a second magnetic layer 404 formed on the antistripping layer.

Regarding claim 46, Vas'ko et al discloses that the first magnetic layers comprise a lamina selected from the group consisting essentially of cobalt-iron-nickel (CoFeNi), cobalt-iron-copper (CoFeCu), cobalt-iron-molybdenum (CoFeMo), cobalt-iron-boron (CoFeB), and cobalt-iron (CoFe) (column 6, lines 47-48).

Regarding claim 47, Vas'ko et al discloses that the lamina comprises alloy (column 5, lines 15-16).

Regarding claim 48, Vas'ko et al discloses that the lamina comprises one selected from a single-layer film and a multi-layer film (see figures 3-5).

Regarding claims 49-50, as far as it is understood, Vas'ko et al discloses that the lamina comprises a mixture with an additional alloy consisting essentially of nickel-iron (NiFe) (column 4, lines 30-34).

Regarding claim 51, Vas'ko et al discloses that the second magnetic layer comprises essential elements of cobalt (Co), nickel (Ni), and iron (Fe) (column 4, lines 31-34).

Regarding claim 52, Vasko et al discloses that the second magnetic layer comprises a laminated structure of a first magnetic sub-layer comprising essential elements of cobalt (Co), nickel (Ni), and iron (Fe) and a second magnetic sub-layer comprising essential elements of nickel (Ni) and iron (Fe), the first magnetic sub-layer being disposed near to the recording gap layer (column 5, lines 5-8 and column 4, lines31-34).

Regarding claims 54 and 57, Vas'ko et al discloses that the second magnetic layer has a crystal structure of a body-centered cubic (bcc) structure (column 4, lines 51-56).

Regarding claims 55 and 58, it is inherent in the reference that the second magnetic layer has a crystal structure of a mixed crystal with a face-centered cubic (fcc) structure and a body-centered cubic (bcc) structure (the thermal annealing produce a combination of fcc and bcc structures).

Regarding claims 53 and 56, it is also inherent that the second magnetic layer has a crystal structure of a face-centered cubic (fcc) for the same reasons as above.

Regarding claim 62, Vas'ko et al discloses that the substrate comprises:

an insulating substrate 302 having a principal surface;

a first magnetic shield layer 306 formed on the principal surface of the insulating substrate;

a magnetic separation layer 308, 312 formed on the first magnetic shield layer, the magnetic separation layer being made of an insulator; and

a magneto-resistive effective element 310 sandwiched in the magnetic separation layer, the first magnetic layer being formed on the magnetic separation layer, the first magnetic layer doubling as a second magnetic shield layer.

Regarding claims 68, 70 and 72, it is inherent in the reference to Vas'ko et al that the magnetic recording medium which has a coercive force of 278600 A/m or more and which has a recording density of 10 gigabits/inch.sup.2 or more (see column 5, lines 5-14).

7. Claims 37-40, 44-45 and 62 are rejected under 35 U.S.C. 102(e) as being anticipated by Hossain et al (U.S. Pat. 6,296,955).

Regarding claim 37, Hossain et al discloses a magnetic head (figures 5-6) comprising:

a substrate having a principal surface;

a first magnetic layer 50 formed on the substrate;

a recording gap layer 52 formed on the first magnetic layer;

an insulating layer 54 formed on the recording gap layer except for a pole tip region;

a write coil 55 enclosed with and insulated by the insulating layer;

an antistripping layer 62, 64 formed on the insulating layer and on the pole tip region of the recording gap layer; and

a second magnetic layer 66 formed on the antistripping layer.

Regarding claim 38, Hossain et al discloses that the antistripping layer comprises:

a non-magnetic layer 62 formed on the insulating layer and on the pole tip region of the recording gap layer; and

a conductive layer 64 formed on the non-magnetic layer, the second magnetic layer being formed on the conductive layer.

Regarding claim 39, Hossain et al discloses that the non-magnetic layer is a lamina made of metal selected from the group consisting essentially of titanium (Ti), tantalum (Ta), chromium (Cr), yttrium (Y), zirconium (Zr), hafnium (Hf), vanadium (V), niobium (Nb), molybdenum (Mo), and tungsten (W) (column 5, lines 12-13).

Regarding claim 40, Hossain shows that the lamina comprises one selected from a single-layer film (see figure 5).

Regarding claims 44-45, it is inherent in the reference to Hossain et al that the non-magnetic layer comprises a lamina made of a single-layer film of metal (Cr) having a tensile stress.

Regarding claim 62, Hossain et al discloses a magnetic head (figure 5) wherein the substrate comprises:

an insulating substrate 41 having a principal surface;

a first magnetic shield layer 42 formed on the principal surface of the insulating substrate;

a magnetic separation layer 44, 49, 48, formed on the first magnetic shield layer, the magnetic separation layer being made of an insulator; and

a magneto-resistive effective element 46 sandwiched in the magnetic separation layer, the first magnetic layer being formed on the magnetic separation layer, the first magnetic layer 50 doubling as a second magnetic shield layer.

8. Claims 37 and 61 are rejected under 35 U.S.C. 102(b) as being anticipated by Schwartz et al (U.S. Pat. 6,473,960).

Regarding claim 37, Schwartz et al discloses a magnetic head (figure 4) comprising:

a substrate having a principal surface;

a first magnetic layer 24 formed on the substrate;

a recording gap layer 34 formed on the first magnetic layer;

an insulating layer 26, 32 formed on the recording gap layer except for a pole tip region;

a write coil 28 enclosed with and insulated by the insulating layer;

an antistripping layer 36 formed on the insulating layer and on the pole tip region of the recording gap layer; and

a second magnetic layer 38 formed on the antistripping layer.

Regarding claim 61, Schwartz et al discloses that a combination of the insulating layer and the write coil is made by successively laminating a first insulating layer 26, the write coil 28, and a second insulating layer 32 on the recording gap layer, the second insulating layer having a periphery end on a side of an air bearing surface (ABS) that is close to the air bearing surface than a periphery end of the first insulating layer (see figure 4).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 41-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hossain et al.

Regarding claims 41-43, Hossain et al discloses the magnetic head described above. Hossain et al further discloses that the non-magnetic layer is made of chromium (Cr) (column 5, lines 12-13). Hossain et al does not disclose that the non-magnetic layer could be made of titanium (Ti) or tantalum (Ta) as well as the value of the claimed thickness.

Official Notice is taken of the fact that is notoriously old and well known in the magnetic head art to modify the parameters of a magnetic head during the course of routine optimization/experimentation. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have had the magnetic head of Hossain et al with the claimed dimension ranges of the thickness and materials of the non-magnetic layer.

The rationale is as follows: one of ordinary skill in the art would have been motivated to have had the magnetic head of Hossain et al with the claimed dimension ranges of the thickness and materials of the non-magnetic layer since such ranges, absent any criticality (i.e., unobvious and/or unexpected results), are generally achievable through routine optimization/experimentation, and since discovering the optimum or workable ranges, where

the general conditions of a claim are disclosed in the prior art, involves only routine skill in the art, *In re Aller*, 105 USPQ 233 (CCPA 1955). Moreover, in the absence of any criticality (i.e., unobvious and/or unexpected results), the parameters set forth above would have been obvious to a person having ordinary skill in the art at the time the invention was made. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

11. Claims 69 and 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schwartz et al or Hossain et al in view of Vas'ko et al.

Regarding claims 69 and 71, neither Schwartz et al or Hossain et al disclose a magnetic recording medium which has a coercive force of 278600 A/m or more and which has a recording density of 10 gigabits/inch.sup.2 or more. Vas'ko et al discloses a recording medium with the claimed recording density. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the magnetic head of Schwartz et al or Hossain et al with the recording medium having the claimed recording density as taught by Vas'ko et al.

The rationale is as follows: one of ordinary skill in the art would have been motivated to provide the magnetic head of Schwartz et al or Hossain et al with the recording medium having the claimed recording density as taught by Vas'ko et al as doing this would allow to store more information in a given volume.

12. Claims 59 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vas'ko et al.

Regarding claims 59-60, Vas'ko et al discloses the magnetic head described above. Vas'ko et al does not disclose that the first or second magnetic layer has a crystal particle

diameter, which is not more than 20 nm. It would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the first and second magnetic layers of Vas'ko et al with crystal particle diameter that is not more than 20 nm.

The rationale is as follows: one of ordinary skill in the art would have been motivated to provide the first and second magnetic layers of Vas'ko et al with crystal particle diameter that is not more than 20 nm as doing this would ensure a shield with high permeability and high saturation moment.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Watanabe et al (U.S. Pat. 6,538,845) discloses a thin film magnetic head; He et al (U.S. Pat. 6,507,457) discloses a magnetic head; Inturi et al (U.S. Pat. 6,342,311) discloses a high magnetic moment seed layer materials for writer pole tips; Mallary (U.S. Pat. 5,311,387) discloses a three pole magnetic recording head.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angel A Castro whose telephone number is 571-272-7584. The examiner can normally be reached on Monday through Thursday, 8 AM to 6 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William R Korzuch can be reached on 571-272-7589. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Angel Castro C

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PRIMARY EXAMINER